User Guide

DTP Systems

DTP T USW 333

Three Input Switcher with Integrated DTP Transmitter

Extron Electronics
INTERFACING, SWITCHING AND CONTROL

68-2564-01 Rev. A
01 14

Safety Instructions

Safety Instructions • English

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Korean

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주의: 이 기호 ⚠ 가 제품에 사용될 경우, 장비와 함께 제공된 책자에 나와 있는 주요 운영 및 유지보수(정비) 지침을 경고합니다.

안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트(**www.extron.com**)의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

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ATTENTION: The Twisted Pair Extension technology works with unshielded twisted pair (UTP) or shielded twisted pair (STP) cables; but, to ensure FCC Class A and CE compliance, STP cables and STP Connectors are required.

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Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

CAUTION: A caution indicates a situation that **may** result in minor injury.

ATTENTION: Attention indicates a situation that may damage or destroy the product or associated equipment.

NOTE: A note draws attention to important information.

TIP: A tip provides a suggestion to make working with the application easier.

Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene,,Op1 scene 1,1 ^B51 ^W^C
[Ø1]RØØØ4ØØ3ØØØØ4ØØØØ8ØØØØ6ØØ[Ø2]35[17][Ø3]
```

Esc X1 *X17* X20* X23* X21 CE ←

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character "Ø" is used for the number zero and "O" is the capital letter "o."

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 2Ø8.132.18Ø.48: bytes=32 times=2ms TTL=32
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx –t
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

Specifications Availability

Product specifications are available on the Extron website, **www.extron.com**.

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Introduction

- About this Guide
- About the DTP T USW 333 Switcher
- Features

About this Guide

This guide describes the Extron DTP T USW 333 switching transmitter. The switcher outputs a signal to a compatible DTP receiver. This guide describes how to install, operate, and configure the switcher.

NOTE: In this guide, the DTP T USW 333 is commonly referred to as a "switcher" or a "switching transmitter."

About the DTP T USW 333 Switcher

The DTP T USW 333 is a 3 input VGA and HDMI switcher with a DTP transmitter output (see figure 1). It switches among one analog VGA and two HDMI inputs, including embedded audio (or DVI video with the appropriate adapters). The switcher converts the selected input, an optional analog audio input, and bidirectional RS-232 and infrared (IR) control signals to a proprietary digital signal. It outputs the signal to a compatible DTP DVI 330 Rx or DTP HDMI 330 Rx receiver. The switcher and receiver extend the usable distance of video, audio, and control signals up to 330 feet (100 m) over a single twisted pair cable.

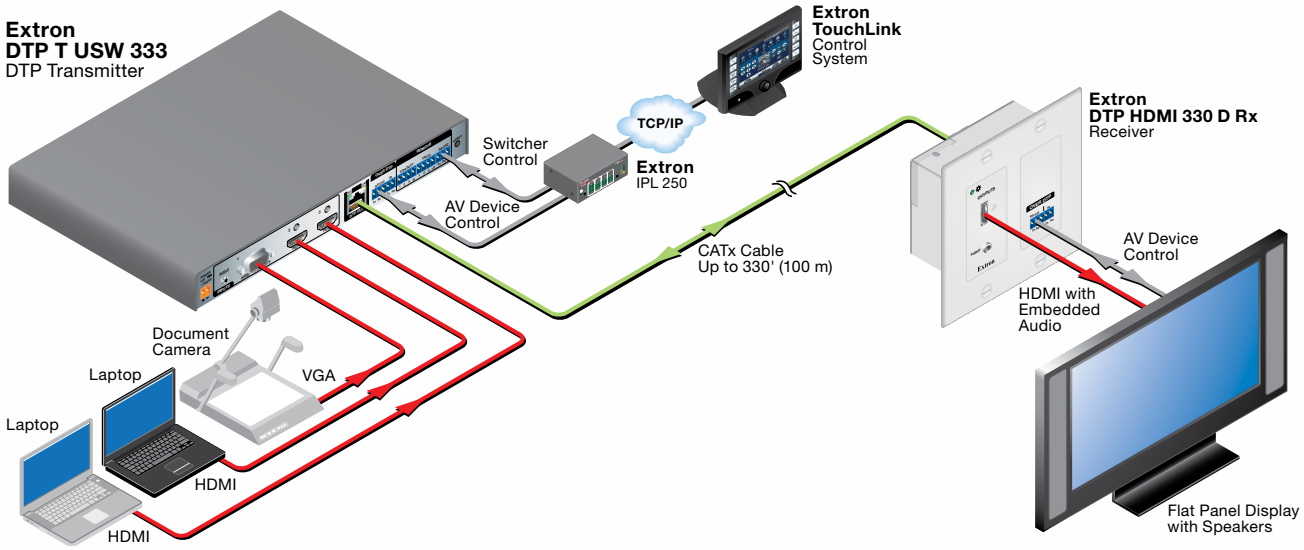


Figure 1. Typical Switching Transmitter Application

The DTP T USW 333 is housed in a half rack width metal enclosure. It can be set on a tabletop or mounted in a rack, or under or through furniture.

The included external desktop 12 VDC power supply accepts 100 to 240 VAC, 50-60 Hz. A single power supply connected to either unit can power both units through the TP cable.

TP Cable

Extron recommends XTP DTP 24 shielded twisted pair (STP) cable for best performance. Category (CAT) 5e, CAT 6, CAT 6a, or CAT 7 STP or unshielded twisted pair (UTP) cable is acceptable. Extron recommends **at least** 24 AWG, solid conductor, STP cable with a minimum bandwidth of 400 MHz.

NOTE: Do **not** use Extron UTP23SF-4 Enhanced Skew-Free AV UTP cable or STP201 cable to link the switching transmitter and receiver. The DTP T USW 333 does not work properly with these cables.

Twisted pair cable is smaller, lighter, more flexible, and less expensive than coaxial cable. The DTP 330-enabled products make cable runs simpler and less cumbersome. Termination of the cable with RJ-45 connectors is simple, quick, and economical.

Control Communications

The RS-232 and IR communications are pass-through only. The switching transmitter and receiver do not generate or respond to the RS-232 and IR communication signals.

Features

Transmits HDMI or analog video, control, and analog audio up to 330 feet (100 meters) over a single CATx cable — The DTP T USW 333 provides high reliability and maximum performance on an economical and easily installed cable infrastructure.

Inputs — Two HDMI, one RGBHV or component video on 15-pin HD, one 3.5 mm stereo mini jack for audio

Supports computer video to 1920x1200, including HDTV 1080p/60 Deep Color and 2K — The DTP T USW 333 supports digital signal transmission up to 330 feet over a single twisted pair cable and maintains superior image quality at the highest resolutions.

Accepts additional analog stereo audio signals — The DTP T USW 333 accepts a direct analog audio connection from Blu-ray Disc players, laptops, or other devices with stereo output and digitizes them for simultaneous transmission over the same single twisted pair cable. A DTP 330 receiver can output balanced and unbalanced audio, allowing streamlined integration within an AV system.

Bidirectional RS-232 and IR insertion for AV device control — Control and IR signals can be transmitted alongside the video signal over DTP connections, allowing the remote device to be controlled without the need for additional cabling. Bidirectional control insertion eliminates the need for control system wiring to remote devices.

Remote powering of transmitter or receiver — For simplified installation, only one power supply is necessary to power both devices.

Digital conversion of analog input signals — Analog signals are digitized, ensuring that a reliable, high quality digital video signal is sent to the output destination.

EDID Minder — Automatically manages EDID communication between connected devices, ensuring that all sources power up properly and reliably output content for display.

Key Minder — Authenticates and maintains continuous HDCP encryption between input and output devices, verifying HDCP compliance for quick, reliable switching in professional AV environments.

Compatible with all DTP HDMI 330 and DTP DVI 330 receivers, and DTP 330-enabled products — Enables mixing and matching with desktop and wallplate receivers, as well as other DTP 330-enabled products to meet application requirements.

Installation and Operation

This section describes the installation and the operation of the DTP T USW 333, including:

- **Mounting the Unit**
- **Connections and Reset Button**
- **Operation**

Mounting the Unit

Mounting instructions can be found in **Mounting the Switcher** on page 18. Compatible optional hardware is listed on the Extron website (**www.extron.com**).

ATTENTION:

- Installation and service must be performed by authorized personnel only.
- Avoid ground potential differences between the switching transmitter and receiver installation sites, which can lead to **equipment damage** or a missing or unstable picture. If a potential difference cannot be avoided, remove the ground connection between the units and locally power both units (see **Disconnecting the Ground** on page 19). In this configuration, the DTP T USW 333 **cannot** extend analog audio and the paired receiver requires its own dedicated power supply.

Connections and Reset Button

Rear Panel Features

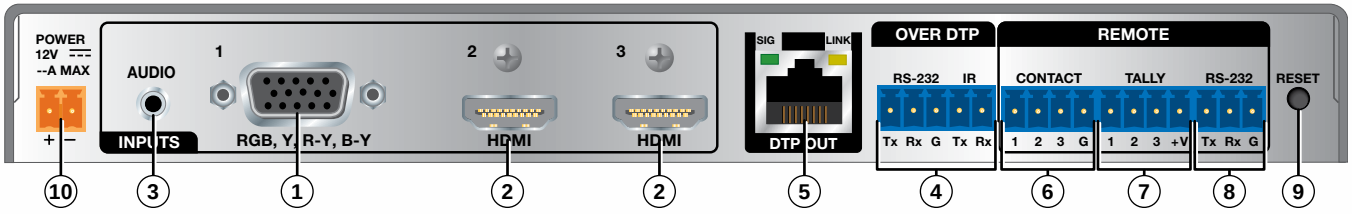


Figure 2. DTP T USW 333 Rear Panel Features

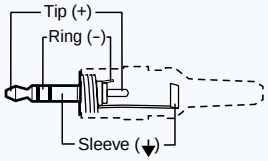
① **RGB, Y, R-Y, B-Y input port (input 1)** — Plug an analog (RGB and component) video source into the switching transmitter via this 15-pin HD connector. See **VGA connector wiring** on page 6 to for connector pinout.

② **HDMI input port (input 2 and 3)** — Plug HDMI digital video sources into the switching transmitter via these HDMI connectors. These connectors can also accept DVI video with appropriate adapters.

③ **Audio input port** — If desired, plug an analog audio input into the switching transmitter via this stereo mini jack connector. Analog audio is **not** embedded into the digital video signal.

NOTES:

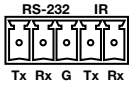
- The analog audio input on this connector is in addition to the digital audio that may be embedded in the HDMI inputs. See the figure at right to identify the connector tip, ring, and sleeve when you are making connections for the switching transmitter from existing audio cables. A mono audio connector consists of the tip and sleeve. A stereo audio connector consists of the tip, ring, and sleeve.



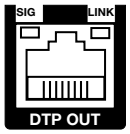
3.5 mm Stereo Plug Connector
(balanced)

- If you have removed the ground jumpers (see **Disconnecting the Ground** on page 19) because of ground potential differences, the DTP T USW 333 cannot extend analog audio. The connected receiver outputs no analog audio.
- The analog audio can be assigned to a specific input or set to be always output (see **Assign analog audio** SIS commands on page 15).

④ **Over DTP RS-232 and IR port** — Plug a serial RS-232 signal, a modulated IR signal, or both into this 3.5 mm, 5-pole captive screw connector for bidirectional RS-232 and IR communication (see see **IR and RS-232 connector wiring** on page 8 to wire the connector).



⑤ **DTP Output RJ-45 port** — Plug one end of a TP cable to this RJ-45 female jack on the switching transmitter. Plug the opposite end of this cable is into the DTP Input RJ-45 connector on a compatible receiver (see **TP cable termination and recommendations** on the next page to properly wire the RJ-45 connector and for detailed **NOTES**).

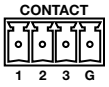


ATTENTION: Do not connect this device to a telecommunications or computer data network.

Signal LED — Lights when the unit is outputting a TMDS clock signal on the DTP output.

Link LED — Indicates a valid link is established between the units on the DTP cable.

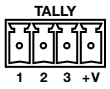
⑥ **Remote Contact port** — If desired, for contact closure control, plug a locally-contructed contact closure device into this 3.5 mm, 4-pole captive screw port. Momentarily short the pin for the desired input (1, 2, or 3) to G to select that input. To force an input to be always selected, leave the short in place.



NOTES:

- Contact closure control overrides front panel input selections.
- For contact closure control, auto switch mode must be off (see **Selecting the switch mode** on page 11).

⑦ **Remote Tally port** — If desired, to remotely identify the currently selected input, plug a locally-constructed device into this 3.5 mm, 4-pole captive screw connector. Connect the power wire for the device into the +V pin and connect the ground wire for the each indicator into the corresponding tally out pin, 1, 2, or 3.



When an input is selected, by either contact closure of front panel selection, the corresponding tally out pin shorts to ground, closing the circuit and lighting the connected indicator (LED).

⑧ **Remote RS-232 port** — Plug a serial RS-232 device into the switching transmitter via this 3.5 mm, 3-pole captive screw connector for remote control of the switching transmitter (see **IR and RS-232 connector wiring** on page 8 to wire the connector).

⑨ **Reset button** — The Reset button initiates two levels of reset of the switcher. For the different reset levels, press and **hold** the button while the switcher is running or while you power up the switcher (see **Reset** on page 11 for details).

⑩ **Power connector** — Plug the included external 12 VDC power supply into either this 2-pole connector (see **Power supply wiring** on page 7 to wire the connector) **or** the power input connector on the receiver (see the *DTP HDMI 330 User Guide* on the Extron website (**www.extron.com**).

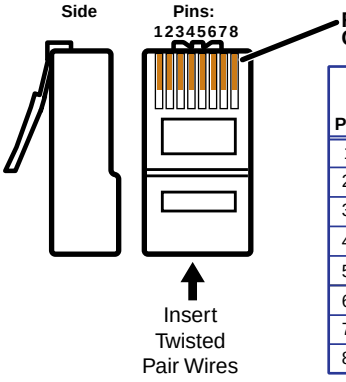
NOTES:

- The power supply included with the switching transmitter can **normally** power both units.
- If you have removed the ground jumpers (see **Disconnecting the Ground** on page 19) because of ground potential differences, one unit of the pair **cannot** remotely power the other unit. Each unit **requires** a local power supply.

Connector and Cable Details

TP cable termination and recommendations

Figure 3 details the **TIA/EIA T 568B** wiring standard. Use this standard to terminate the DTP cable with RJ-45 connectors.



Pin	TIA/EIA T 568B Wire color
1	White-orange
2	Orange
3	White-green
4	Blue
5	White-blue
6	Green
7	White-brown
8	Brown

Figure 3. TP Cable Termination

NOTE: Do **not** use Extron UTP23SF-4 Enhanced Skew-Free AV UTP cable or STP201 cable to link the switching transmitter and receiver. The DTP T USW 333 Tx/Rx does not work properly with these cables.

Supported cables

The DTP T USW 333 is compatible with CAT 5e, 6, 6a, and 7 shielded twisted pair (F/UTP, SF/UTP, and S/FTP) and unshielded twisted pair (U/UTP) cable.

Cable recommendations

Extron recommends using the following practices to achieve full transmission distances up to 330 feet (100 m) and reduce transmission errors.

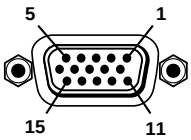
- Use the following Extron XTP DTP 24 SF/UTP cables and DTP 24 connectors for the best performance:
  - **XTP DTP 24/1000** Non-Plenum 1000' (305 m) spool 22-236-03
  - **XTP DTP 24P/1000** Plenum 1000' (305 m) spool 22-235-03
  - **XTP DTP 24 Plug** Package of 10 101-005-02
- If not using XTP DTP 24 cable, at a minimum, Extron recommends 24 AWG, solid conductor, STP cable with a minimum bandwidth of 400 MHz.
- Terminate cables with shielded connectors to the TIA/EIA T 568 B standard.
- Use no more than two pass-through points, which may include patch points, punch down connectors, couplers, and power injectors. If these pass-through points are required, use CAT 6 or 6a shielded couplers and punch down connectors.

NOTE: When using TP cable in bundles or conduits, consider the following:

- Do not exceed 40% fill capacity in conduits.
- Do not comb the cable for the first 20 meters, where cables are straightened, aligned, and secured in tight bundles.
- Loosely place cables and limit the use of tie wraps or Velcro®.
- Separate twisted pair cables from AC power cables.

VGA connector wiring

The 15-pin HD (VGA) universal analog input ports accept RGB (RGBHV, RGBS, RGsB) and component video. Figure 4 shows the pinouts for each format type on the connector.



Pin	RGBHV	RGBS	Component	Pin	RGBHV	RGBS	Component
1	Red	Red	R-Y	9	NC	NC	NC
2	Green	Green	Y	10	Ground	Ground	NC
3	Blue	Blue	B-Y	11	NC	NC	NC
4, 5	NC	NC	NC	12	NC	NC	NC
6	Red return	Red return	R-Y return	13	H sync	C sync	NC
7	Green return	Green return	Y return	14	V sync	NC	NC
8	Blue return	Blue return	B-Y return	15	NC	NC	NC

Figure 4. VGA Connector

Power supply wiring

NOTES:

- The power supply included with the switching transmitter can **normally** power both units.
- If you have removed the ground jumpers (see **Disconnecting the Ground** on page 19) because of ground potential differences, one unit of the pair **cannot** remotely power the other unit. Each unit **requires** a local power supply.

Figure 5 shows how to wire the connector. Use the supplied tie-wrap to strap the power cord to the extended tail of the connector.

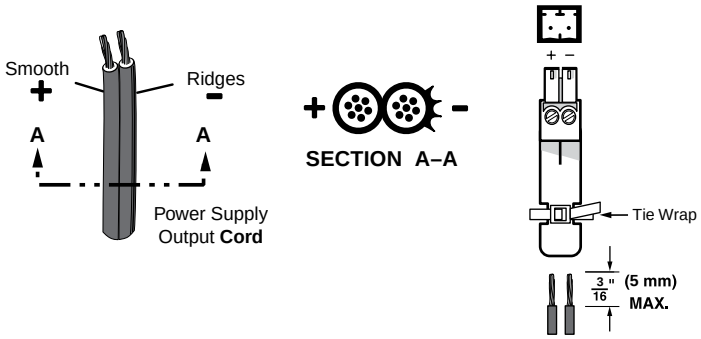


Figure 5. Power Connector Wiring

CAUTION: Electric shock hazard —

- The two power cord wires must be kept separate while the power supply is plugged in. Remove power before wiring.
- The length of exposed wires is critical. The ideal length is 3/16 inch (5 mm).
  - If the stripped section of wire is longer than 3/16 inch, the exposed wires may touch, causing a short circuit.
  - If the stripped section of wire is shorter than 3/16 inch, wires can be easily pulled out even if tightly fastened by the captive screws.
- Do not tin the power supply leads before installing them in the connector. Tinned wires are not as secure in the connector and could be pulled out.

ATTENTION:

- This product is intended to be supplied by a Listed Power Unit marked “Class 2” or “LPS,” rated 12 VDC, 1.0 A minimum. Always use a power supply supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities.
- The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to a building structure or similar structure.
- Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply and the unit. The ridges on the side of the cord (see figure 5) identify the power cord negative lead.

To verify the polarity before connection, plug in the power supply with no load and check the output with a voltmeter.

IR and RS-232 connector wiring

Figure 6 shows how to wire the Remote RS-232 and Over DTP RS-232 and IR connectors.

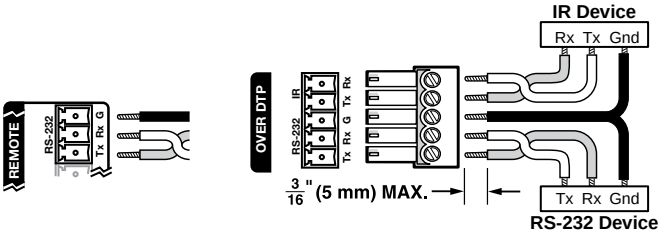


Figure 6. IR and RS-232 Connectors Wiring

NOTES:

- The IR Tx and Rx line pair and the RS-232 Tx and Rx line pairs must each cross once between their connectors and the source or destination.
- The length and preparation of exposed wires is important (see the second and third power connector **CAUTIONS** on the previous page for details).

Front Panel Configuration Port

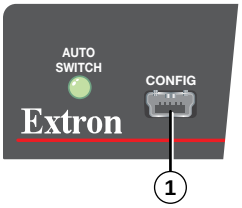


Figure 7. Front Panel Configuration (Config) Port

① **Configuration port** — This mini USB B port serves a similar communications function as the rear panel Remote RS-232 port, but it is easier to access than the rear port after the switcher has been installed and cabled.

NOTE: A front panel Configuration port connection and a rear panel Remote RS-232 port connection can both be active at the same time. If commands are sent simultaneously to both, the command that reaches the processor first is handled first.

Operation

Controls and Indications

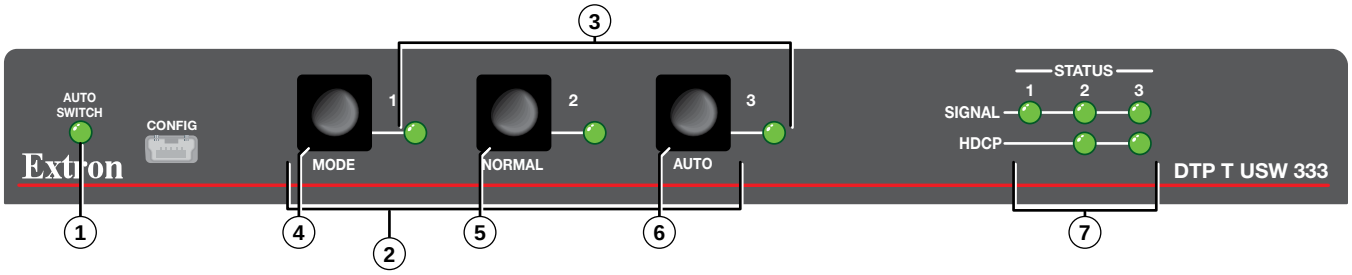


Figure 8. **Power Indicators**

Auto Switch mode indicator

① **Auto Switch LED** — When lit, indicates that the switcher is in auto-input switching mode. When unlit, the switch is in normal (manual) mode (see **Selecting the switch mode** on page 11).

Input selection controls and indicators

② **Input 1 through 3 buttons** — Each Input button selects the associated input for output (see **Switching inputs** on the next page).

The Input buttons are also used to toggle auto-input switching mode on and off (see "Auto-input switching mode controls," below).

③ **Input 1 through 3 LEDs** — The input LEDs identify the selected input.

Auto-input switching mode controls

The switcher supports auto-input switching mode. When auto-input switching mode is enabled, the switcher continuously monitors all inputs and automatically switches to the highest-numbered input with video sync pulses present. If video is absent from all inputs, input 1 is selected.

④ **Mode button** — The Mode button is used with the Normal button or the Auto button to select the switching mode (see **Selecting the switch mode** on page 11).

This button is a secondary function of the Input 1 button.

⑤ **Normal button** — The Normal button is used with the Mode button to select normal mode (see **Selecting the switch mode** on page 11).

This button is a secondary function of the Input 2 button.

When you change from auto-input switching to normal (manual) mode, the last input selected in auto-input switching mode remains selected until you manually select a different input.

⑥ **Auto(switch) button** — The Auto button is used with the Mode button to select auto-input switchinging mode (see **Selecting the switch mode** on page 11).

This button is a secondary function of the Input 3 button.

Status LEDs

⑦ **Status LEDs** —

Signal LEDs (1 through 3) — Indicates that the switcher detects Horizontal sync (Signal LED 1) or TMDS clock (Signal LED 2 and Signal LED 3) on the associated input.

HDCP LEDs (2 and 3) — Indicates that the input signal is HDCP encrypted.

Front Panel Operations

The following paragraphs detail the power up process and provide sample procedures for switching inputs, changing between normal and auto-input switching mode, and toggling executive mode on and off.

Power

Power is automatically applied when the power cord is connected to an AC source. When AC power is applied, the switcher performs a self-test that blinks the front panel LEDs during the test. An error-free power up self-test sequence leaves the Auto Switch and Input LEDs on or off in the same configuration as they were when power was last removed.

If an error occurs during the self-test, the switcher locks up and will not operate. If your switcher locks up on power-up, call the Extron S3 Sales & Technical Support Hotline.

Plug in all system components and turn on the input devices (such as Blu-Ray players and computers) and the output devices. Set the input devices to output video using the operating instructions of that device. Select an input. The image should appear on the screen. If no image appears, see **Troubleshooting — If No Image Appears** on the next page.

Switching inputs

Select an input for transmission to the receiver using the front panel buttons as follows:

1. Select the desired input by pressing the associated input button (see figure 9).

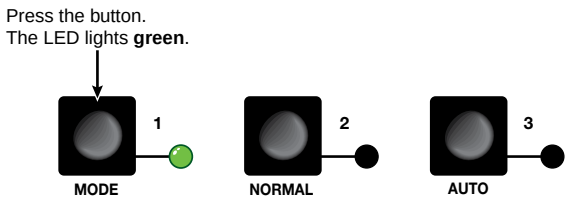


Figure 9. Selecting an Input

2. Observe that the LED for the selected input lights.

NOTE: The switcher must be in normal (manual) mode.

An input can also be selected using an RS-232 or USB device or a contact closure device (see **Remote Control**, beginning on page 12).

Selecting the switch mode

NOTE: In the auto-input switching mode that is available from the front panel, the switcher selects to the highest numbered input with a sync signal present. See the **Front panel mode** SIS commands on page 15 for an auto-input switching low mode, which selects the lowest numbered input.

Turn auto-input switching mode on and off as follows:

1. Press and hold the Mode (Input 1) button (see figure 10).

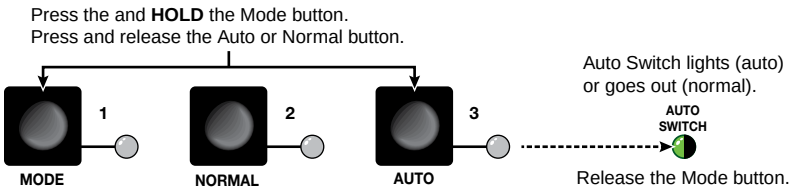


Figure 10. Selecting a Mode

2. Press and release the button for the desired mode

   Auto (Input 3) — The Auto Switch LED lights.

   Normal (Input 2) — The Auto Switch Active LED goes off.

3. Release the Mode button.

Front panel security lockout (Executive mode)

The switcher has a front panel lock feature that locks the front panel. If you try to make front panel input selections when the panel is locked, all front panel LEDs flash three times.

Toggle the front panel lock on and off as follows:

1. Push and **hold** the Input 1, Input 2, and Input 3 buttons simultaneously for 5 seconds.

   All front panel LEDs flash three times.

2. Release the buttons.

When the front panel is locked, contact closure and RS-232 control are still available.

Reset

Use the recessed rear panel Reset button to initiate two levels of reset as follows:

Reset to default settings — Press and **hold** the reset button for approximately 6 seconds. All front panel LEDs cycle. Release the button. This reset is the equivalent of issuing the **Reset** SIS command (Esc ZXXX ←).

Reset to factory default condition — Cycle unit power off and on while **holding** the reset button. All front panel LEDs cycle. Release the button.

Troubleshooting — If no Image Appears

1. Ensure that all devices are plugged in and powered on. The switcher is receiving power if one of the input LEDs is lit.
2. Ensure an active input is selected on the switcher or that the switcher is in auto-input switching mode.
3. Ensure that the proper signal format is supplied.
4. Check the cabling and make corrections as necessary.
5. Call the Extron S3 Sales & Technical Support Hotline if necessary.

Remote Control

This section includes:

- **Contact Closure Control**
- **Simple Instruction Set Control**

The DTP T USW 333 switcher can be remotely controlled via its rear panel Remote RS-232 port, its front panel configuration (USB) port, and its rear panel Remote Contact port. Remote control devices can be:

- A host device such as a computer or control system and the Extron Simple Instruction Set
- A contact closure device such as an Extron KP 6 Keypad Control or a Show Me video cable

Contact Closure Control

The rear panel Remote Contact port (see **item** ⑥ on page 4) provides a way to select an input to the switcher using a remote contact closure device. The contact closure pin assignments are shown on page 4.

NOTE: The switcher must be in normal (manual) mode.

To select a different input number using a contact closure device, momentarily short the pin for the desired input number to ground. To force one of the inputs to be always selected, leave the short to ground in place. The short overrides front panel input selections.

Simple Instruction Set Control

The DTP T USW 333 switching transmitter can be remotely controlled using SIS commands from a host device such as a computer or control system via its rear panel Remote RS-232 port (see **item** ⑧ on page 5) or front panel Configuration (USB) port (see **item** ① on page 8).

The default serial port protocol of the port is as follows:

- 9600 baud
- No parity
- 8-bit
- No flow control
- 1 stop bit

Host-to-Switcher Communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command character sequence. When a command is valid, the switcher executes the command and sends a response to the host device. All responses from the switcher to the host end with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Switcher-Initiated Messages

When a local event occurs, such as a front panel operation, loss or restoration of an input signal, or an error condition, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below:

© Copyright 20*yy*, Extron Electronics DTP T USW 333, V*x.xx*, 60-*nnnn-nn*↵

The switcher issues the copyright message when it first powers on. V*x.xx* is the firmware version number and 60-*nnnn-nn* is the part number.

In*n* All↵

The switcher also sends the In*n* message whenever the selected input is changed. *n* is the input number. A 0 in the *n* field indicates no input is selected.

Error responses

When the switcher receives a valid SIS command, it executes the command and sends a response to the host device. If the switcher is unable to execute the command because the command is invalid or it contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

E01 — Invalid input channel number (out of range)
E06 — Invalid channel change
E10 — Invalid command
E13 — Invalid parameter

Timeout

Pauses of 10 seconds or longer between command ASCII characters result in a timeout. The command operation is aborted with no other indication.

Using the Command and Response Table

The **command and response table** begins on the next page. Symbols are used throughout the table to represent variables in the command and response fields. Command and response examples are shown throughout the table. The ASCII to HEX conversion table below is for use with the command and response table.

Space →

ASCII to Hex Conversion Table										Esc	1B	CR	ØD	LF	ØA
	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Symbol definitions

- ↵ = Carriage return/line feed
- ← = Carriage return (no line feed)
- | = Pipe (can be used interchangeably with the ← character)
- • = space
- Esc = Escape key
- **W** = Can be used interchangeably with the Esc character
- X1 = Input number — Ø or 1 through 3 (Ø = no input for switching command or always output for audio assignment)
- X2 = Switch mode — Ø = Manual (**default**); 1 = Auto-input switching high; 2 = Auto-input switching low
- X3 = Status — Ø = Off, disabled, or not detected; 1 = on, enable, or detected
- X4 = HDMI input — 2 or 3
- X5 = Input HDCP status — Ø = No source is detected; 1 = Source is detected with HDCP; 2 = Source detected without HDCP
- X6 = Output HDCP status — Ø = No sink is detected; 1 = Sink is detected with HDCP; 2 = Sink is detected without HDCP
- X7 = EDID — See **table 1** on page 16.
- X8 = User EDID location — 66, 67, or 68
- X9 = Raw EDID data — 128 or 256 bytes of hexadecimal data
- X10 = Resolution and rate in plain text — Example: `192Øx12ØØ•@6ØHz`
- X11 = Analog input video format — Ø = Auto detect (**default**); 1 = RGB (VGA); 2 = YUV/component video
- X12 = Switcher name — A text string of up to 24 alphanumeric characters and minus sign/hyphen (-). No blank or space characters are permitted as part of a name. The first letter must a letter, and the last character must not be a minus sign/hyphen.
- X13 = Firmware version number to second decimal place *(x.xx)*
- X14 = Verbose mode — Ø = clear/none (**default**); 1 = verbose mode (default for RS-232 or USB); 2 = tagged responses for queries; 3 = verbose mode and tagged for queries

Command and Response Table for SIS Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Select and view input			
Select an input	X1!	InX1•All↵	Select input X1 to transmit to the connected receiver.
Example:	1!	InØ1•All↵	Select input 1.
View input selection	!	X1↵	Input X1 is selected.
Front panel mode			
Set normal switch mode	EscØAUSW←	AuswØ↵	Set switch mode to normal. **Default**.
Set auto switch mode high	Esc1AUSW←	Ausw1↵	Set switch mode to auto (high). The switcher automatically selects the highest-numbered input with a signal present.
Set auto switch mode low	Esc2AUSW←	Ausw2↵	Set switch mode to auto (low). The switcher automatically selects the lowest-numbered input with a signal present.
View front panel switch mode	EscAUSW←	X2↵	
Assign analog audio input to specific video input or always output audio			
Always output analog audio	EscØAFLW←	AflwØ↵	Analog audio is output regardless of input selection. **Default**.
Assign (lock) analog audio to a specific input	EscX1AFLW←	AflwX1↵	Assign analog audio to input X1.
View audio assignment	EscAFLW←	X1↵	
Input signal status			
Request status of all inputs and the output	EscØLS←	Sig•X3[1]•X3[2]•X3[3]*X3[0]↵	X3[1] through X3[3] are the signal status of inputs 1 through 3. X3[0] is the output signal status.
HDCP Status			
View the HDCP status of an HDMI input	EscIX1HDCP←	HdcpIX5↵	
View the HDCP status of both HDMI inputs	EscIHDCP←	HdcpIX5[2]•X5[3]↵	
View the output HDCP status	EscOHDCP←	HdcpOX6↵	
HDCP Authorized Device			
Set HDMI input to HDCP authorized	EscEX4*1HDCP←	HdcpEX4*1↵	**Default**.
Set HDMI input to HDCP not authorized	EscEX4*ØHDCP←	HdcpEX4*Ø↵	
Set HDCP authorization, both HDMI inputs	EscEX3HDCP←	HdcpEX3↵	
View HDCP authorized status	EscEHDCP←	X3[2]•X3[3]↵	Status of input 2 and input 3.
Front panel security lockout (executive mode)			
Lock front panel	1X	Exe1↵	Set lock on.
Unlock front panel	ØX	ExeØ↵	Set lock off. **Default**.
Read lock status	X	X3↵	Lock status = X3.

NOTE:
- X1 = Input number — Ø or 1 through 3 (Ø = no input for switching command or always output for audio assignment)
- X2 = Switch mode — Ø = Manual (**default**); 1 = Auto-input switching high; 2 = Auto-input switching low
- X3 = Status — Ø = Not detected, authorized; 1 = Detected, authorized
- X4 = HDMI input — 2 or 3
- X5 = Input HDCP status — Ø = No source detected; 2 = Source detected without HDCP; 1 = Source detected with HDCP
- X6 = Output HDCP status — Ø = No sink detected; 1 = Sink detected with HDCP; 2 = Sink detected without HDCP

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
EDID Minder			
NOTE: See table 1, below for the EDID values.			
Assign EDID to an input	Esc A X1 * X7 EDID ←	EdidA X1 * X7 ↵	**Defaults**: Ø3 and 5Ø.
Save the EDID of the connected display to a user location	Esc S X8 EDID ←	EdidS X8 ↵	Save EDID of display connected to the output to the user store slot **66**, **67**, or **68**.
View the EDID assignment	Esc A X1 EDID ←	X7 ↵	
View raw EDID data	Esc R X1 EDID ←	X9 ↵	Read data as text from the EDID assigned and used on input X1.
View EDID native resolution	Esc N X1 EDID ←	X10 ↵	Read out native resolution and refresh rate from the EDID assigned to the specified input in plain text. Example: 1920x1200 @60Hz

Table 1. EDID Values

X7	Value	X7	Value	X7	Value	X7	Value
VGA – PC values							
Ø1	800x600 @ 60 Hz	Ø5	1280x800 @ 60 Hz	Ø9	1400x1050 @ 60 Hz	13	1680x1050 @ 60 Hz
Ø2	1024x768 @ 60 Hz	Ø6	1280x1024 @ 60 Hz	1Ø	1440x900 @ 60 Hz	14	1920x1080 @ 60 Hz
Ø3*	**1280x720 @ 60 Hz**	Ø7	1360x768 @ 60 Hz	11	1600x900 @ 60 Hz	15	1920x1200 @ 60 Hz
Ø4	1280x768 @ 60 Hz	Ø8	1366x768 @ 60 Hz	12	1600x1200 @ 60 Hz	16	2048x1080 @ 60 Hz
DVI – PC values							
17	800x600 @ 60 Hz	21	1280x800 @ 60 Hz	25	1400x1050 @ 60 Hz	29	1680x1050 @ 60 Hz
18	1024x768 @ 60 Hz	22	1280x1024 @ 60 Hz	26	1440x900 @ 60 Hz	3Ø	1920x1080 @ 60 Hz
19	1280x720 @ 60 Hz	23	1360x768 @ 60 Hz	27	1600x900 @ 60 Hz	31	1920x1200 @ 60 Hz
2Ø	1280x768 @ 60 Hz	24	1366x768 @ 60 Hz	28	16001200 @ 60 Hz	32	2048x1080 @ 60 Hz
HDMI – PC values, with 2-channel audio							
33	800x600 @ 60 Hz	37	1280x1024 @ 60 Hz	41	1440x900 @ 60 Hz	45	1920x1200 @ 60 Hz
34	1024x768 @ 60 Hz	38	1360x768 @ 60 Hz	42	1600x900 @ 60 Hz	46	2048x1080 @ 60 Hz
35	1280x768 @ 60 Hz	39	1366x768 @ 60 Hz	43	1600x1200 @ 60 Hz		
36	1280x800 @ 60 Hz	4Ø	1400x1050 @ 60 Hz	44	1680x1050 @ 60 Hz		
HDMI – HDTV values, with 2-channel audio							
47	480p @ 60 Hz	**5Ø†**	**720p @ 60 Hz**	53	1080p @ 50/25 Hz	56	1080p @ 60 Hz
48	576p @ 50 Hz	51	1080i @ 50 Hz	54	1080p @ 50 Hz		
49	720p @ 50 Hz	52	1080i @ 60 Hz	55	1080p @ 60/24 Hz		
HDMI – HDTV values, with multi-channel audio							
57	720p @ 50 Hz	59	1080i @ 50 Hz	61	1080p @ 50/25 Hz	63	1080p @ 60/24 Hz
58	720p @ 60 Hz	6Ø	1080i @ 60 Hz	62	1080p @ 50 Hz	64	1080p @ 60 Hz
Output and user locations							
X7	Source	X7	Source	X7	Source	X7	Source
65	Output	66	User location 1	67	User location 2	68	User location 3

* Default for input 1.

† Default for inputs 2 and 3.

NOTE:		
	X1 = Input number	1 through 3
	X7 = EDID	See table 1, above.
	X8 = User EDID location	66, 67, or 68
	X9 = Raw EDID data	128 or 256 bytes of hexadecimal data
	X10 = Resolution and rate in plain text	Example: 1920x1200•@60Hz

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Input 1 (only) video format			
Set format	1*X11\	TypX11↵	Set input 1 to format X11.
Example:	1*Ø\	TypØ↵	Set input 1 to autodetect.
View format	1\	X11↵	View set format.
View detected format	1*\	X11↵	View detected format (X11 = 1 or 2 only).
Video mute			
Mute video	1B	Vmt1↵	Output no video signal.
Unmute video	ØB	VmtØ↵	Output selected video input.
Read video mute	B	X3↵	Mute status = X3.
Analog audio mute			
Mute analog audio	1Z	Amt1↵	Output no analog audio signal.
Unmute analog audio	ØZ	AmtØ↵	Output analog audio input.
Read analog audio mute	Z	X3↵	Analog audio mute status = X3.
Disable (Mute) HDMI Output Embedded Audio			
Enable HDMI audio output	Esc1AFMT←	Afmt1↵	Enable HDMI audio. (**Default**)
Disable HDMI audio output	EscØAFMT←	AfmtØ↵	Disable HDMI audio.
View HDMI audio configuration	EscAFMT←	X3↵	
Device Name			
Set the unit name	EscX12CN←	Ipn•X12↵	Change the name to one of your choosing.
Set unit name to factory default	Esc•CN←	Ipn•DTP-T-USW-333↵	Set name to default.
View unit name	EscCN←	X12↵	
Reset			
Reset to factory setting	EscZXXX←	Zpx↵	Reset to factory defaults.
Reset to factory setting and device name	EscZQQQ←	Zpq↵	Reset to factory defaults, including, default name (DTP-T-USW-333).
Information requests			
Information request	I	InX1•AflwX1•AuswX2•VmtX3•AmtX3↵	
Example:	I	In1•Aflw2•Ausw1•Vmt1•AmtØ↵	Input 1 is selected, analog audio is assigned to input 2, the switcher is in auto-input switching (high) mode, video is muted and analog audio is unmuted.
Request part number	N	60-*nnnn-nn*↵	See the Extron website, **www.extron.com**, for part numbers.
Query controller firmware version	Q	X13↵	
Example:	Q	1.23↵	The factory-installed controller firmware version is 1.23 (sample value only).
Verbose mode			
NOTE: If tagged responses are enabled (modes 2 and 3), all "view" commands return the prefix and the value, just as the "set" commands do. For example, the View front panel switch mode (EscAUSW←) command returns "AuswX2↵".			
Set verbose mode	EscX14CV←	VrbX14↵	
Read verbose mode	EscCV←	X14↵	

NOTE:
- X1 = Input number — Ø or 1 through 3 (Ø = always output for audio assignment)
- X2 = Switch mode — Ø = Manual (**default**) 1 = Auto-input switching high 2 = Auto-input switching low
- X3 = Status — Ø = Off, disabled, or not detected 1 = on, enable, or detected
- X11 = Analog input video format — Ø = Auto detect (**default**) 1 = RGB (VGA) 2 = YUV/component video
- X12 = Switcher name — A text string of up to 24 alphanumeric characters and minus sign/hyphen (-).
- X13 = Firmware version number to second decimal place (*x.xx*)
- X14 = Verbose mode — Ø = clear/none (**default**) 2 = tagged responses for queries; 1 = verbose mode (default for RS-232 or USB) 3 = verbose mode and tagged for queries

Reference Information

This section provides procedures for mounting the DTP T USW 333 switching transmitter and disconnecting the ground between it and a compatible receiver.

- **Mounting the Switcher**
- **Disconnecting the Ground**

Mounting the Switcher

ATTENTION:

- Installation and service must be performed by authorized personnel only.
- Avoid ground potential differences between the switching transmitter and receiver installation sites, which can lead to **equipment damage** or a missing or unstable picture. If a potential difference cannot be avoided, remove the ground connection between the units and locally power both units (see **Disconnecting the Ground** on the next page).

The 1-inch high, half rack width DTP T USW 333 switching transmitter can be placed on a table, mounted in a rack, or mounted under a desk or table.

Tabletop Use

Affix the included rubber feet to the bottom of the unit and place it in any convenient location.

Mounting kits

Mount the unit using any optional compatible mounting kit listed on the Extron website (**www.extron.com**), in accordance with the directions included with the kit. For rack mounting, see **UL Rack-Mounting Guidelines** on the next page.

UL Rack-Mounting Guidelines

The following Underwriters Laboratories (UL) requirements pertain to the installation of the unit into a rack.

- **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (TMA = +122 °F, +50 °C) specified by Extron.
- **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **Reliable earthing (grounding)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as use of power strips).

Disconnecting the Ground

If you cannot resolve a ground potential difference between the switching transmitter and receiver installation sites (as suggested by a missing or unstable picture), remove the ground connection between the units as follows:

NOTE: Once you have removed the ground jumpers, the DTP T USW 333 **cannot** extend analog audio and one unit **cannot** remotely power the other. **No** analog audio is output and the paired **receive**r requires its own dedicated power supply.

1. Disconnect any cables and remove the switching transmitter from any rack or other installation option.
2. Remove and retain the screws (nine screws, three on each side and three on top) securing the cover to the switching transmitter. Slide the cover forward slightly and lift it off the unit (see figure 11).

TIP: Be careful not to bend the electrical contact “legs” of the button and LED assemblies on the circuit board. If the buttons or LEDs are misaligned with the holes in the cover, it may be difficult to reassemble the switcher.

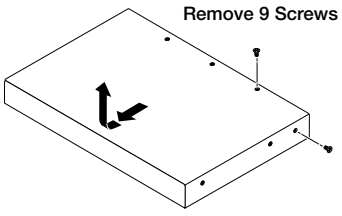


Figure 11. Opening the Switching Transmitter

3. Locate and **lift off** jumpers JMP1 and JMP2 (see figure 12).

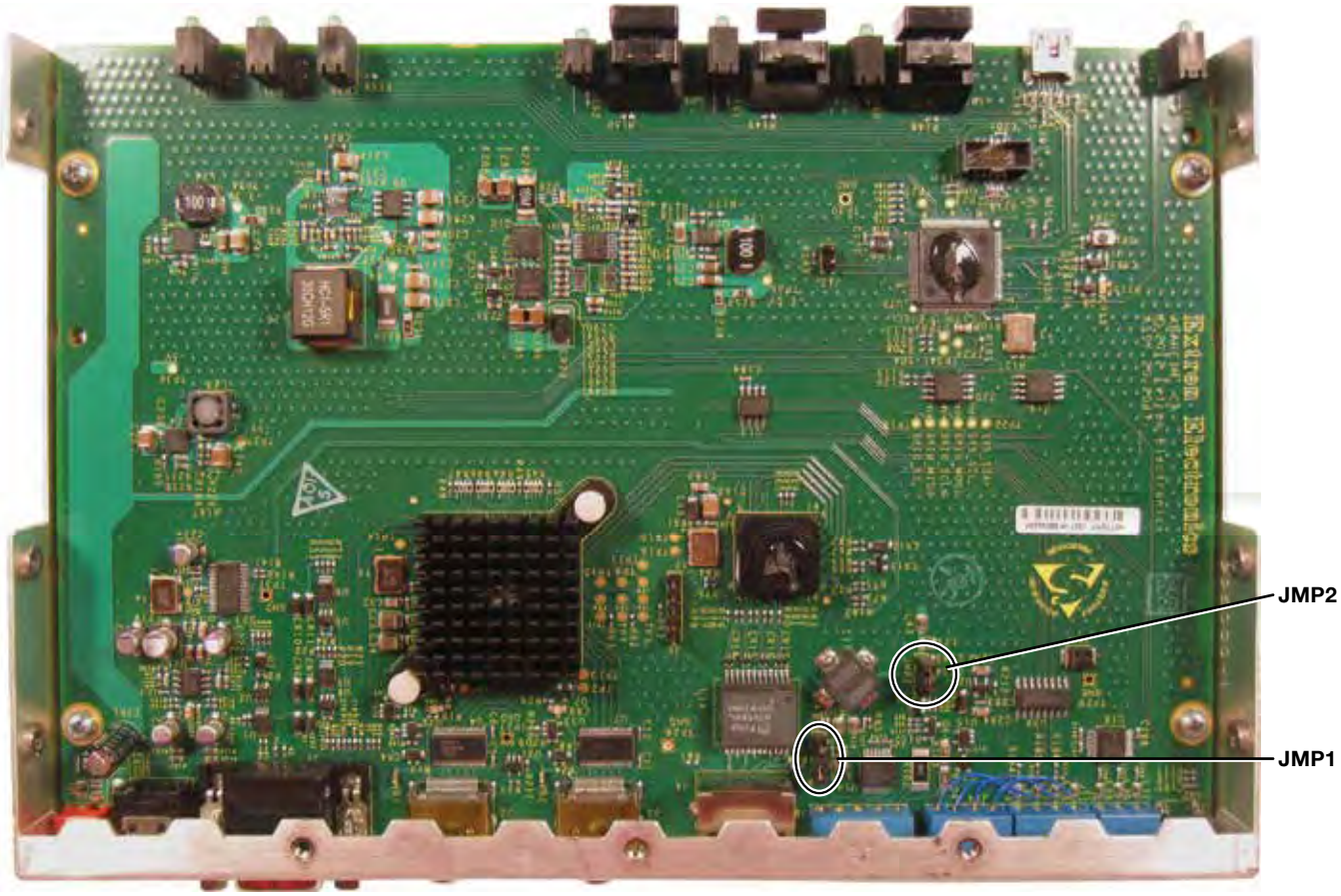


Figure 12. Jumper Locations

4. Reinstall the switcher cover, securing it in place with the screws removed in step 2.
5. Reinstall the switcher in the rack or other installation option (see **Mounting the Switcher** on page 18).
6. **If you are using shielded cable**, disconnect the cable shield from the connector at either end of the cable.
7. See the manual for the applicable receiver, DTP DVI 330 Rx or DTP HDMI 330 Rx, available on the Extron website (**www.extron.com**), and remove the ground jumpers in the receiver.
8. Obtain a second 12 V power supply (one supply is provided with the switching transmitter and normally powers both units), and locally power both units (see **Power supply wiring** on page 7).

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America,
and Central America:
Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

Japan:
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe and Africa:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:
Extron Asia Pte Ltd
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA:	714.491.1500 or 800.633.9876	**Europe:**	31.33.453.4040
Asia:	65.6383.4400	**Japan:**	81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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